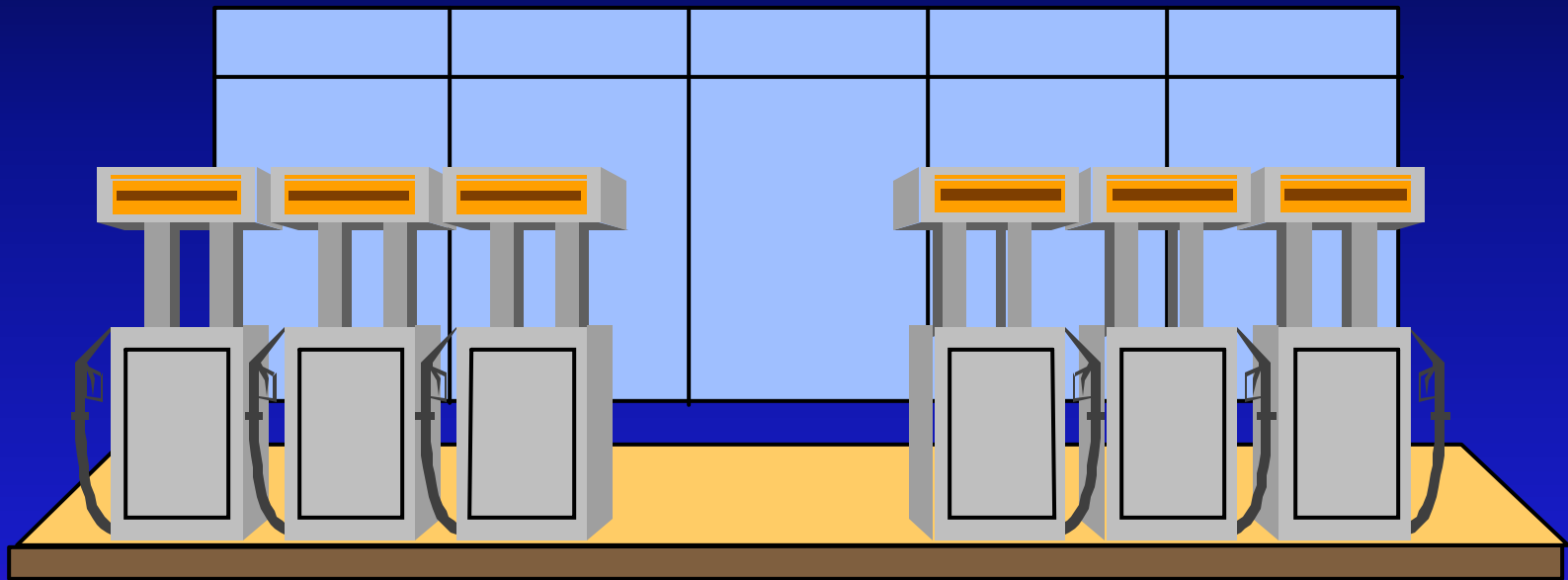


ENHANCED VAPOR RECOVERY

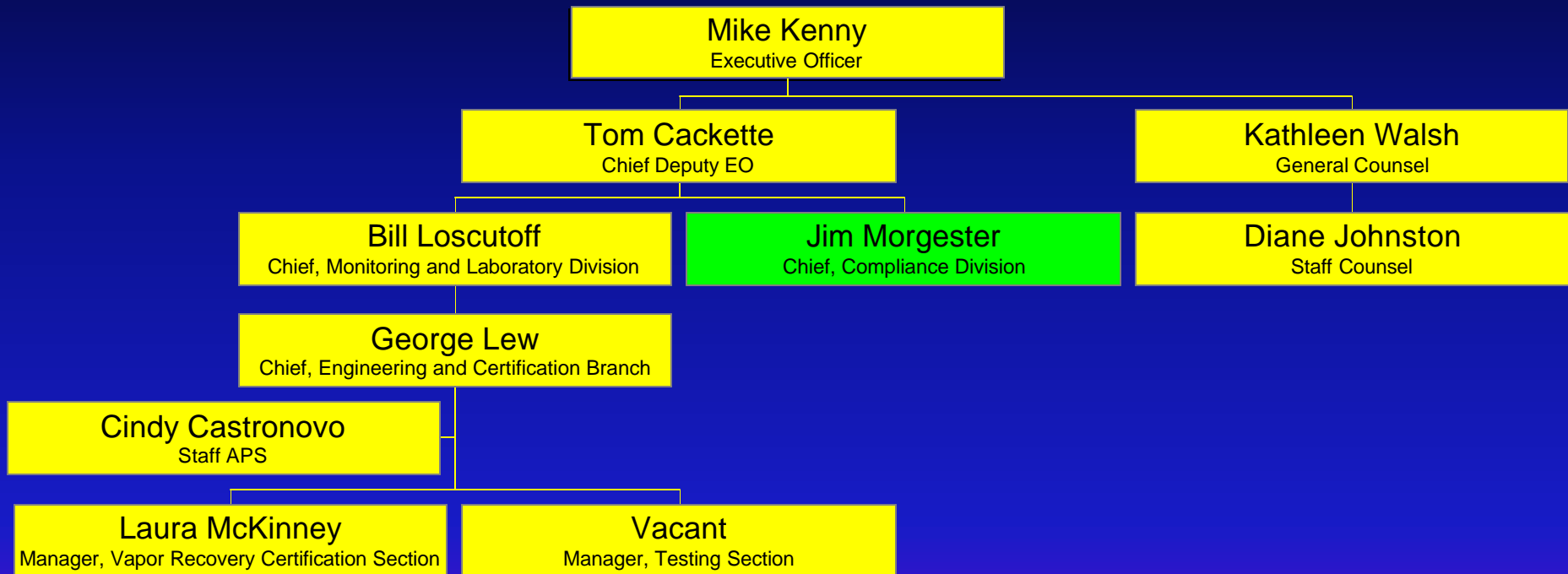
July 13, 2000



California Environmental Protection Agency
Air Resources Board

www.arb.ca.gov/vapor/evr/evr.htm

CARB Vapor Recovery Program Organization



Outline

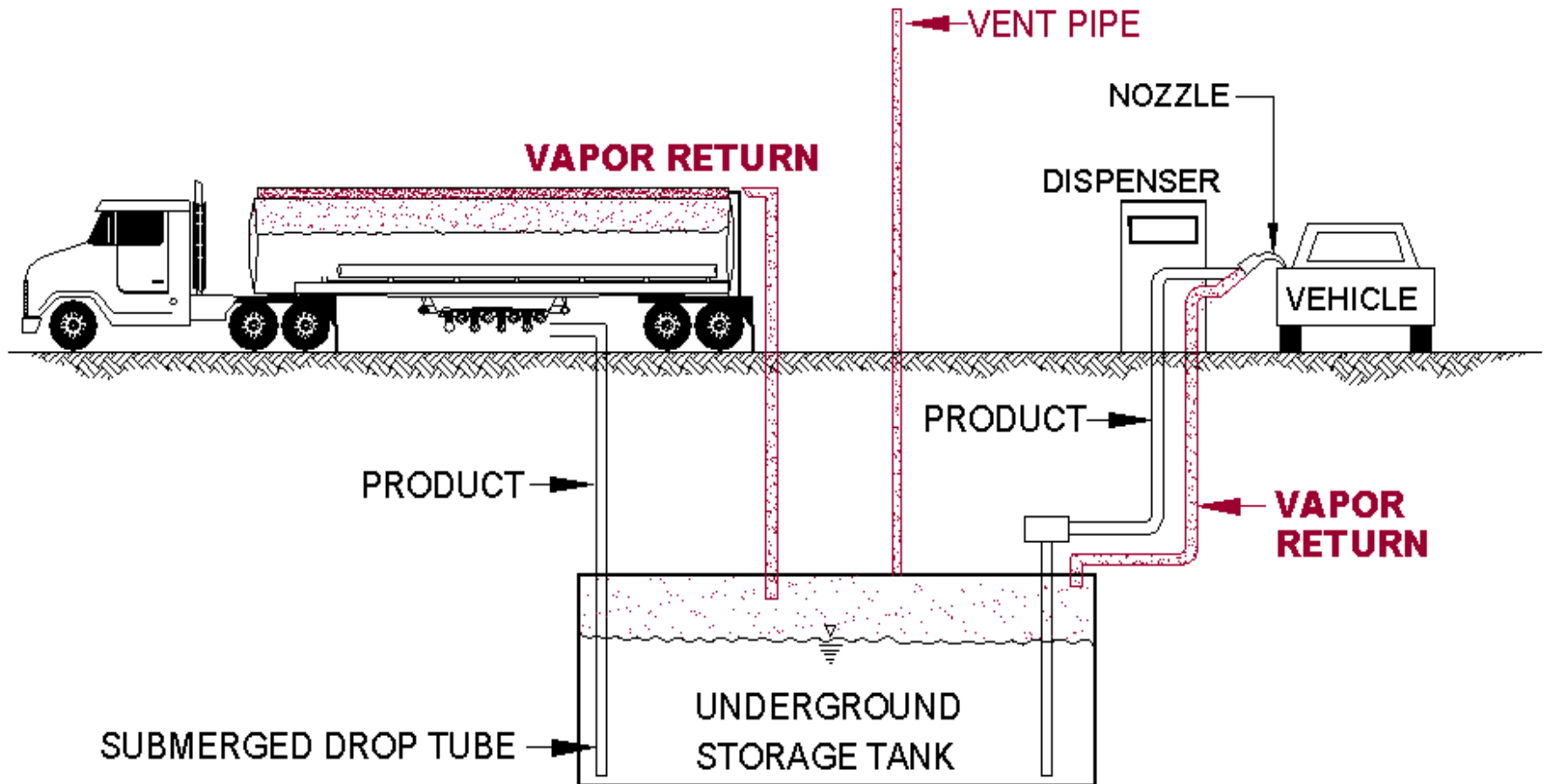
- Background
- Vapor Recovery Program History
- EVR Overview
- Technology Review
- Regulatory Schedule
- EVR Implementation



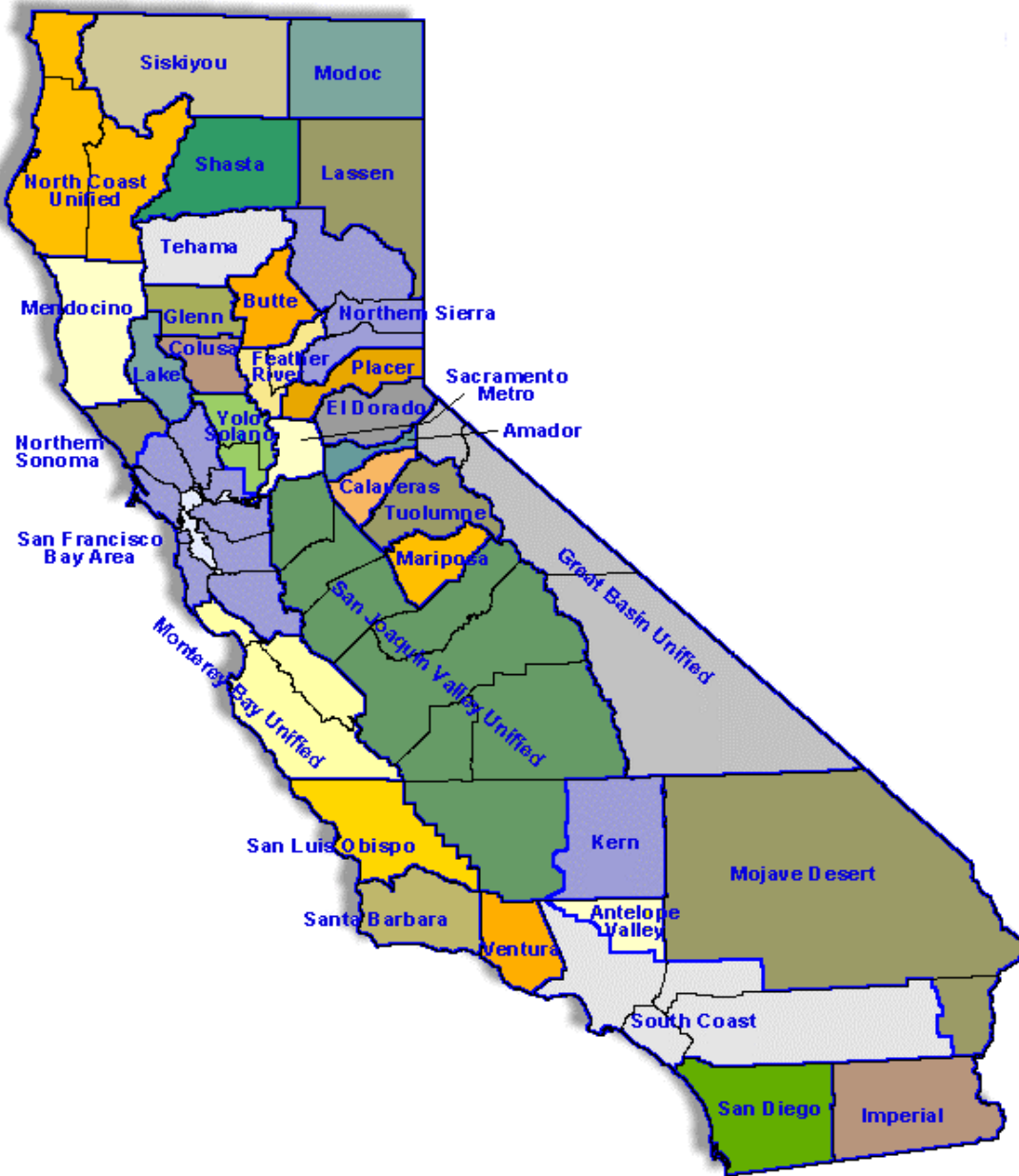
CA Phase I and Phase II Vapor Recovery = USEPA Stage 1 and Stage 2

PHASE I SYSTEM

PHASE II SYSTEM



California Air Districts



CA Air Pollution Control Districts

CAPCOA Committees

- CAPCOA = California Air Pollution Control Officers Association
- CAPCOA Vapor Recovery Technical Committee
- CAPCOA Enforcement Managers

Vapor Recovery Historical Highlights

1972 & 1973

Bay Area & San Diego require Phase I & II

1974

California Health & Safety Code 41954

- performance standards which are reasonable and necessary to achieve or maintain ambient air quality standard
- CARB shall certify that gasoline vapor control systems meet standards

Historical Highlights (continued)

1976

CARB adopts certification procedures

1981

First spitback & spillage performance standards

1985

CA Air Toxics Control Measure

State law to reduce benzene exposure

Historical Highlights (continued)

1990

Federal Clean Air Act Amendments

Stage 2 (Gas Station) Vapor Recovery **AND**
Onboard Refueling Vapor Recovery (ORVR)

- specify CARB-certified equipment
- establish certification program using CARB certification and test procedures
- establish certification and test procedures which are approved by EPA as equivalent to CARB's

Historical Highlights (continued)

1996

CARB amends certification and test procedures
New specifications, but no new standards,
did not trigger recertification

2000

CARB “approves” Enhanced Vapor Recovery
Numerous new standards and changes to
certification process

EVR in rulemaking process - not yet “adopted”

Volume 2: Certification and Test Procedures for Gasoline Vapor Recovery Systems

- CP = Certification Procedure
- TP = Test Procedure
 - 201: Gasoline Dispensing Facility
 - 202: Bulk Plants
 - 203: Terminals
 - 204: Cargo Tanks
 - 205: Novel Facilities

Units for Primary Performance Standards

- Emission Limit:
lbs/1000 Gallons (controlled)
- Efficiency:
% (controlled/uncontrolled)

ARB and District Roles in California's Vapor Recovery Program

- ARB develops procedures
- ARB certifies systems
- Districts adopt rules
- Districts permit systems and conduct compliance inspections

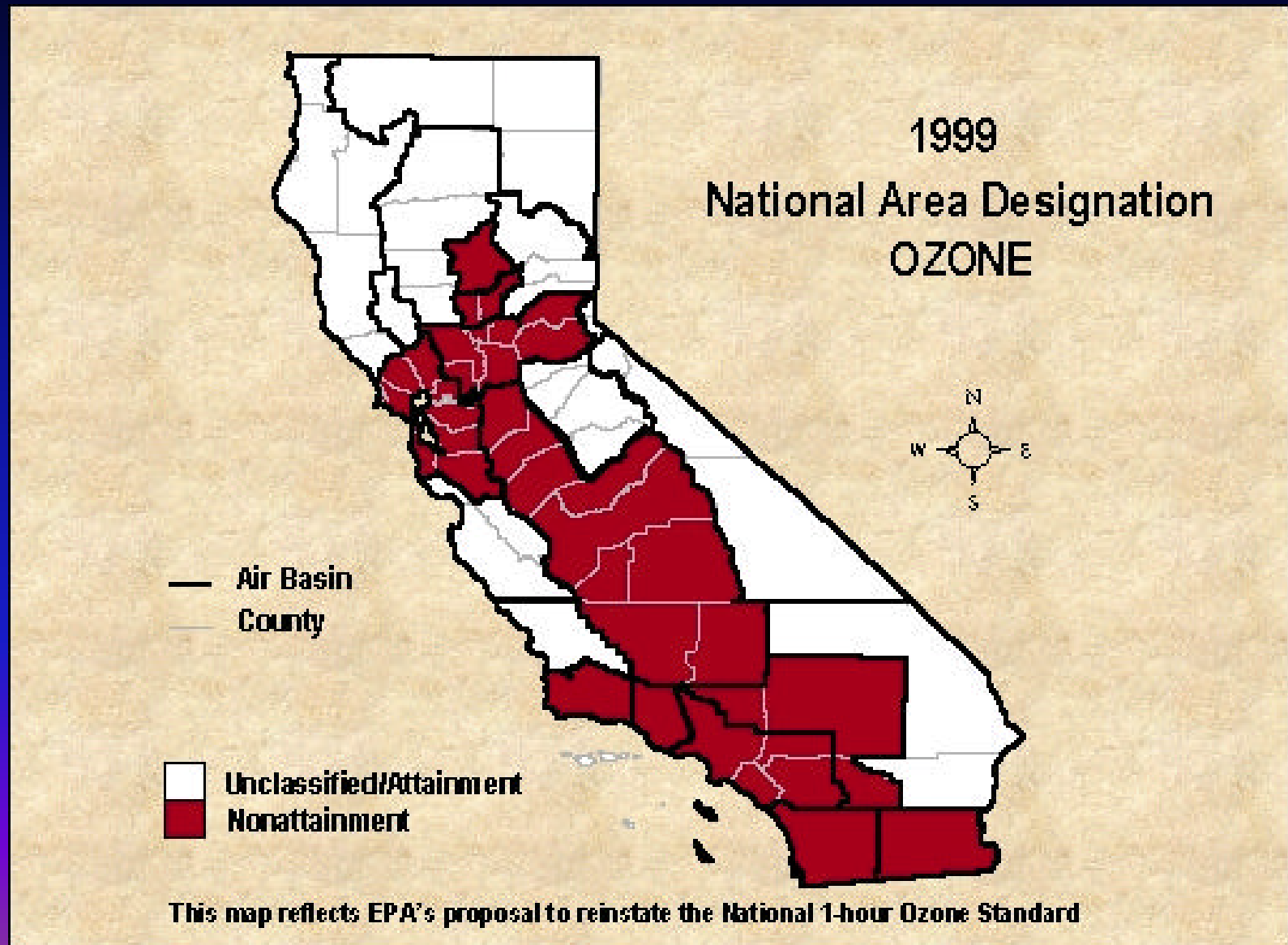
CARB Certification Process for Phase 1 and Phase II Systems

- Application by equipment manufacturer
- Install equipment at test site
- Periodic testing during operational test
 - currently 90 days minimum
- Emission test for primary standard
 - currently 100-car test for efficiency
- Approval from CalOSHA, SFM, DMS
- Draft Executive Order for district review
- Issue Executive Order

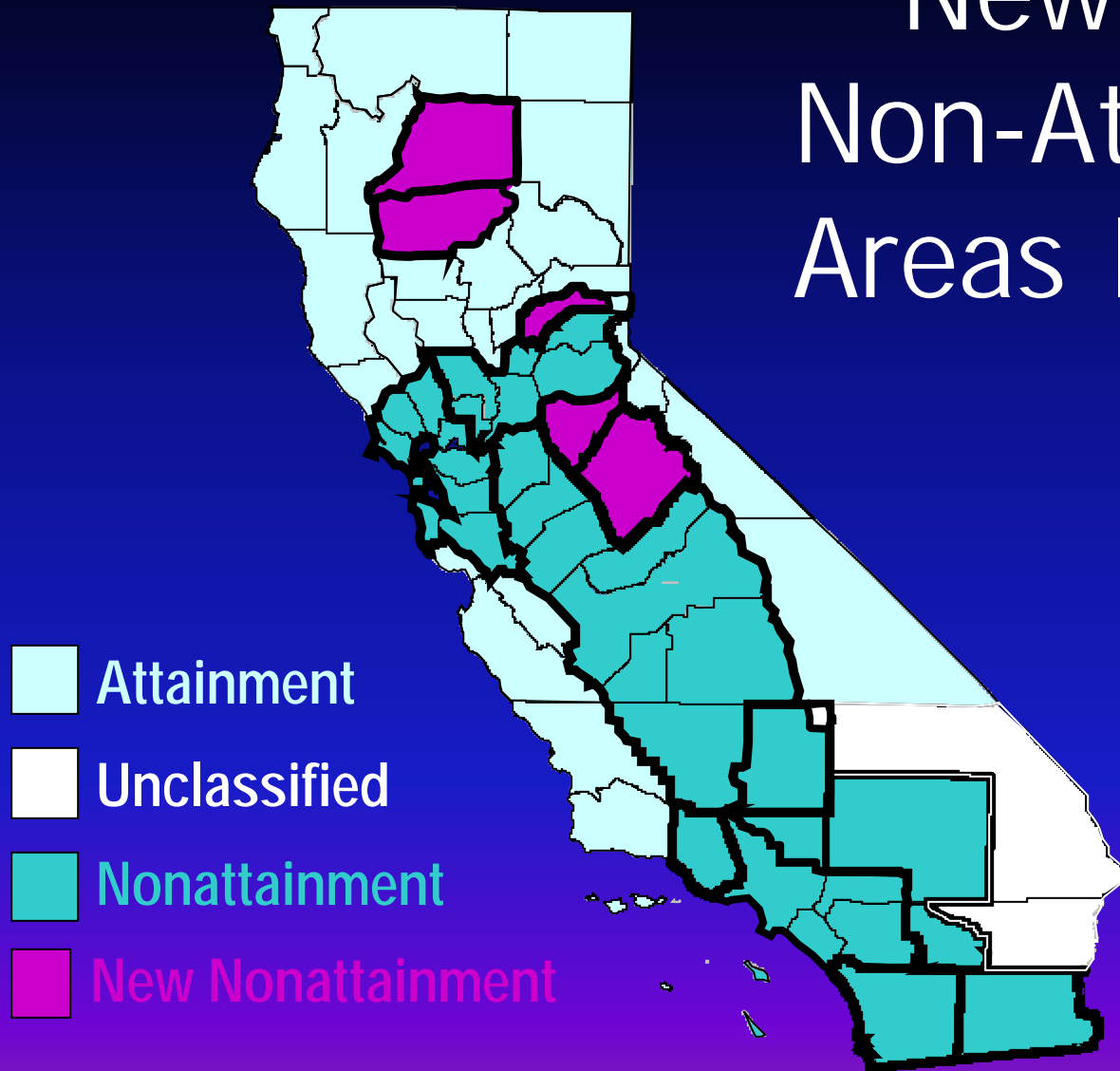
Executive Orders and Approval Letters

- Executive Orders (EOs) describe equipment allowed for certified system
 - May dictate operational constraints
 - May include testing requirements
- Approval letters provide updates to Executive Orders
 - add allowable equipment
- Approval letters not anticipated for EVR

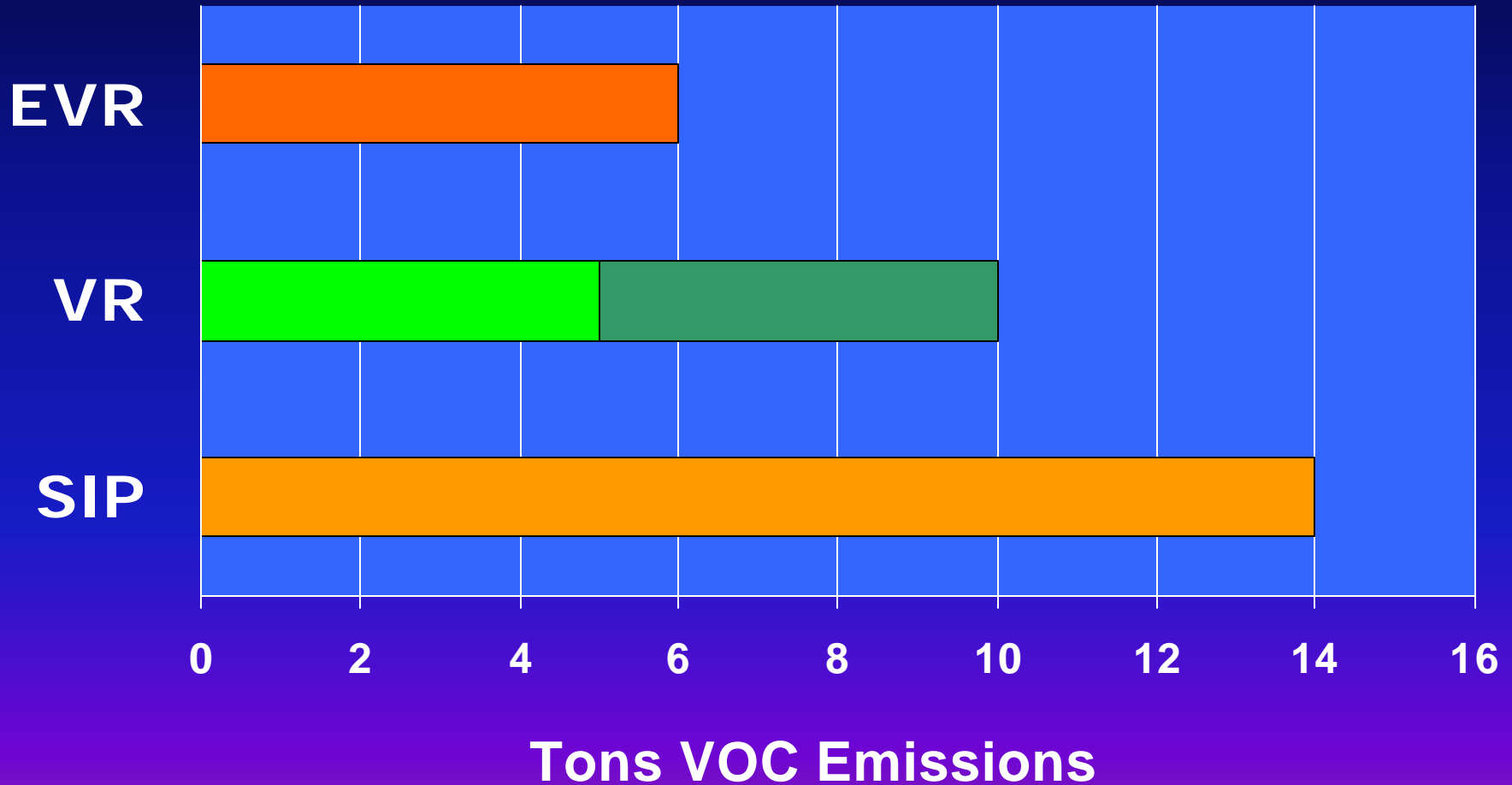
California Exceeds Ozone Standards



New Ozone Non-Attainment Areas Identified



SIP Lawsuit Agreement



CAPCOA/ARB Field Inspections

- Inspections in six districts
 - 1600 assist nozzles
 - 1000 balance nozzles
 - 280 drop tubes
- Results
 - 11VAI aluminum spout off the market
 - VST hoses fixed and replaced
 - 11VAI vapor path resolved
 - curley-Q problem fixed

EVR Improves Existing Systems and Goes Beyond Today's Standards

Enhanced Vapor Recovery

Current Standards

Existing System Performance

25 tpd

EVR Goals and Strategy

Goals

- Increase in-use performance of service station vapor recovery systems
- Additional emission reductions

Strategy

- Fix existing problems (short-term)
- EVR proposal (long-term)

Activities Addressing Currently Installed Systems in CA

- Parts houses enforcement
- Maintenance manuals
- Considering decertification of some problem equipment
- Simple inspection procedures

Summary of the EVR Amendments

Module 1: Phase I vapor recovery

Module 2: Phase II vapor recovery

Module 3: ORVR compatibility

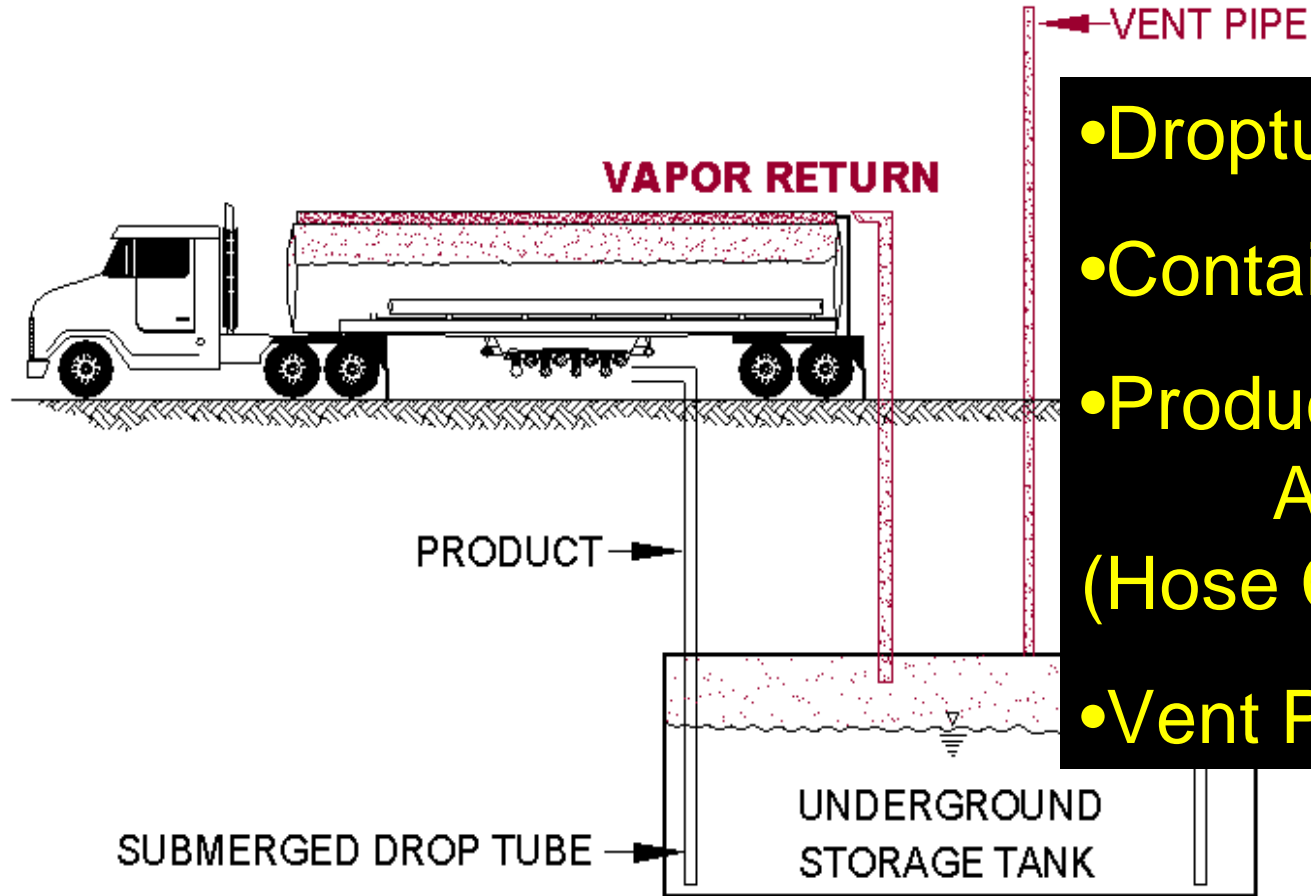
Module 4: Liquid retention and spitback

Module 5: Spillage and dripless nozzles

Module 6: In-Station diagnostics

Certification Changes

Phase I Vapor Recovery



- Droptubes
- Containment boxes
- Product and Liquid Adaptors (Hose Connectors)
- Vent Pipe Valves

Module 1

Phase I Vapor Recovery

- Increase Phase I transfer efficiency from 95% to 98%
- Improve equipment components
 - P/V valves
 - Phase I fittings
 - drain valves



Module 2 Phase II Vapor Recovery

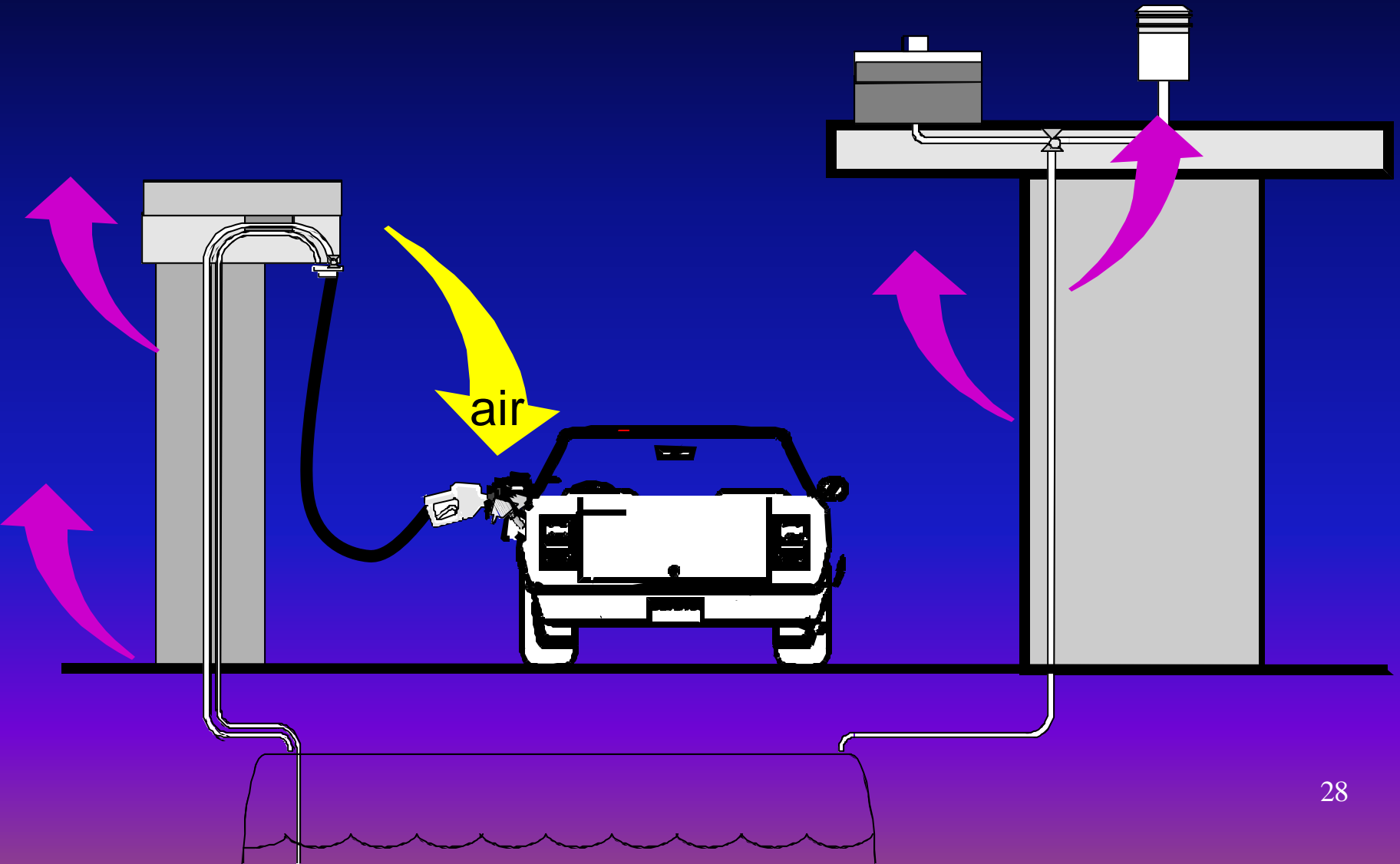
- Numerous significant changes to certification process and standards
 - pressure-related fugitives
 - storage tank pressure limits
 - emission factor
 - component specifications
 - vapor processors

Phase II

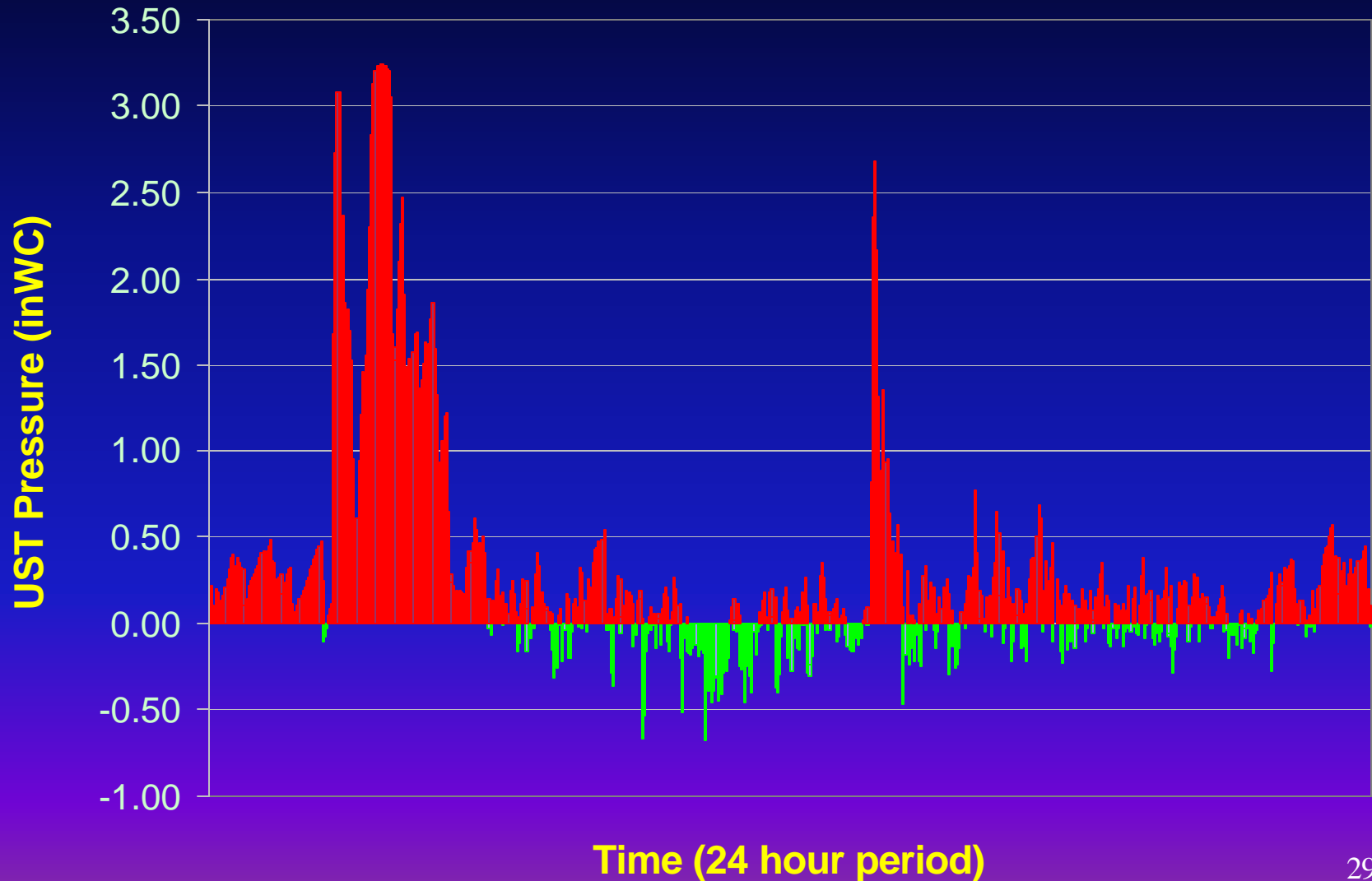
Balance and Assist Nozzles



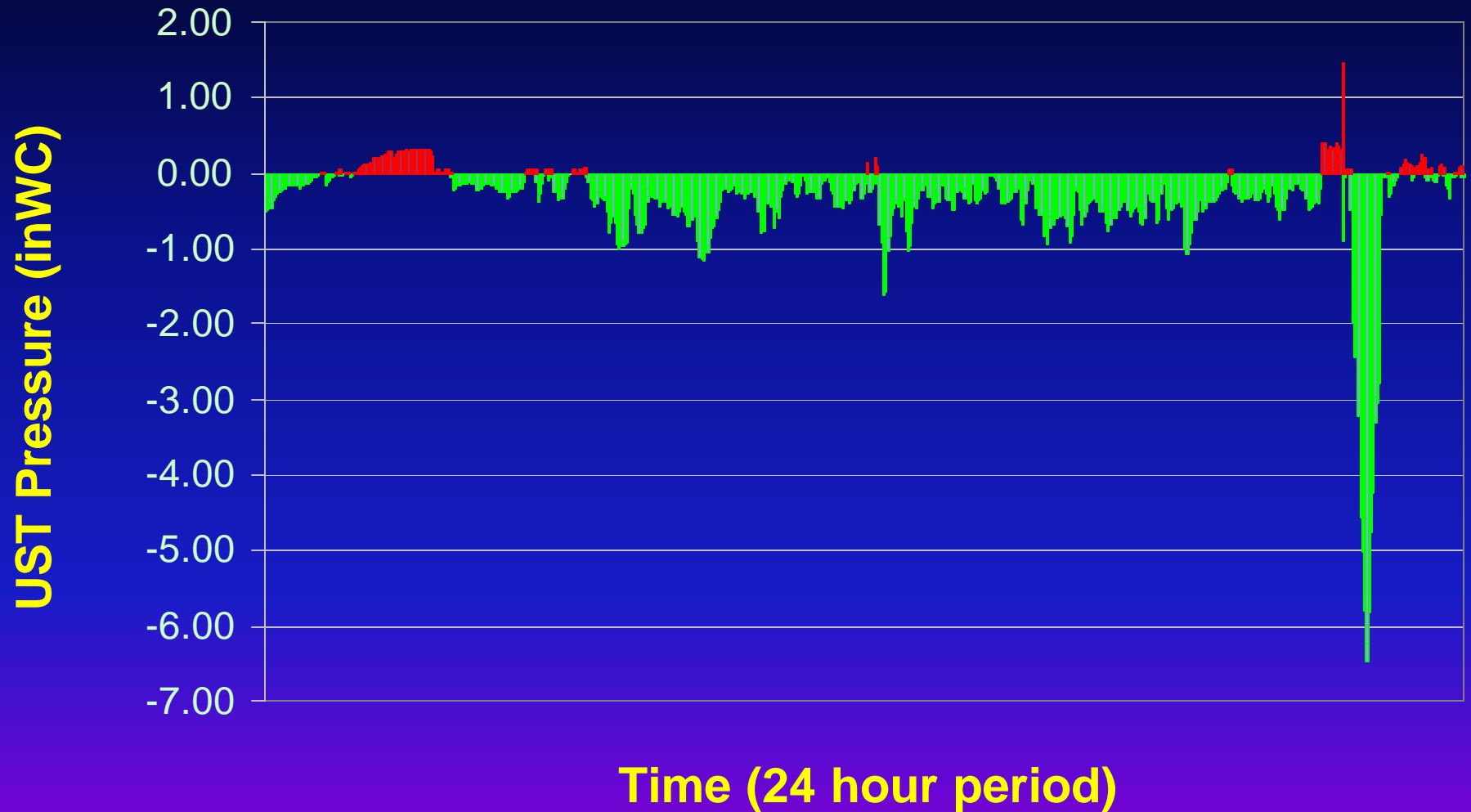
Pressure-Related Fugitives



Pressure Data from Balance Station (as found)



Pressure Data from Balance Station (tight system)



Underground Storage Tank Pressure Monitoring

- Proposed limits would allow slight positive pressures
 - hourly high pressure less than 1.5 in water
 - 30-day average less than 0.25 in water
- Signal when excessive leaks occur
 - atmospheric pressure for extended periods
- Exclude periods after bulk drop

Efficiency vs. Emission Limit

- Current
 - State: 90% efficiency, districts 95%
- Original EVR Proposal
 - change from 90% to 0.38 lbs/1000 gallons
- Amended EVR Proposal
 - Summer Certification Testing
 - 0.38 lbs/1000 gallons **AND** 95% efficiency
 - Winter Certification Testing
 - 0.38 lbs/1000 gallons **OR** 95% efficiency

New Component Standards

- Pressure drop budget for balance system components
- Vapor check valves
- Unihose dispenser



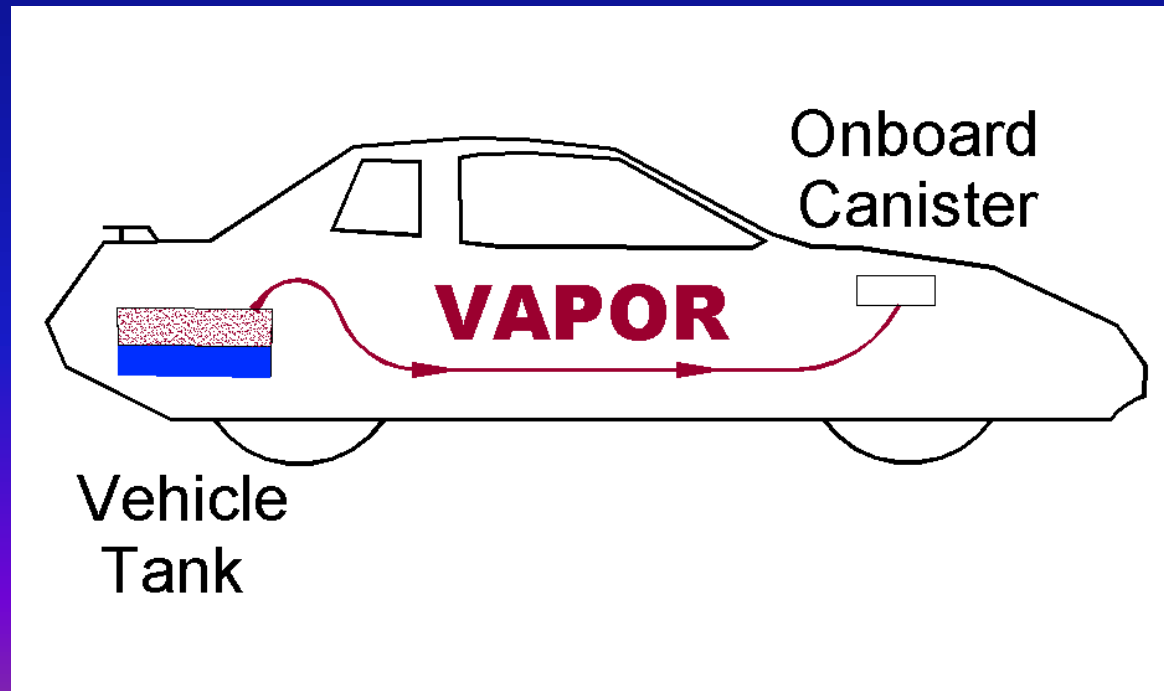
Air Pollutant Emissions from Processors

- All Processors
 - max HC rate < 3.8 lb/1000 gal
 - benzene < 7.2 lbs/year
- Destructive Processors
 - 1,3-butadiene < 1.2 lbs/year
 - formaldehyde < 36 lbs/year
 - acetaldehyde < 84 lbs/year
- Affected Certifications
 - Hirt, Hasstech



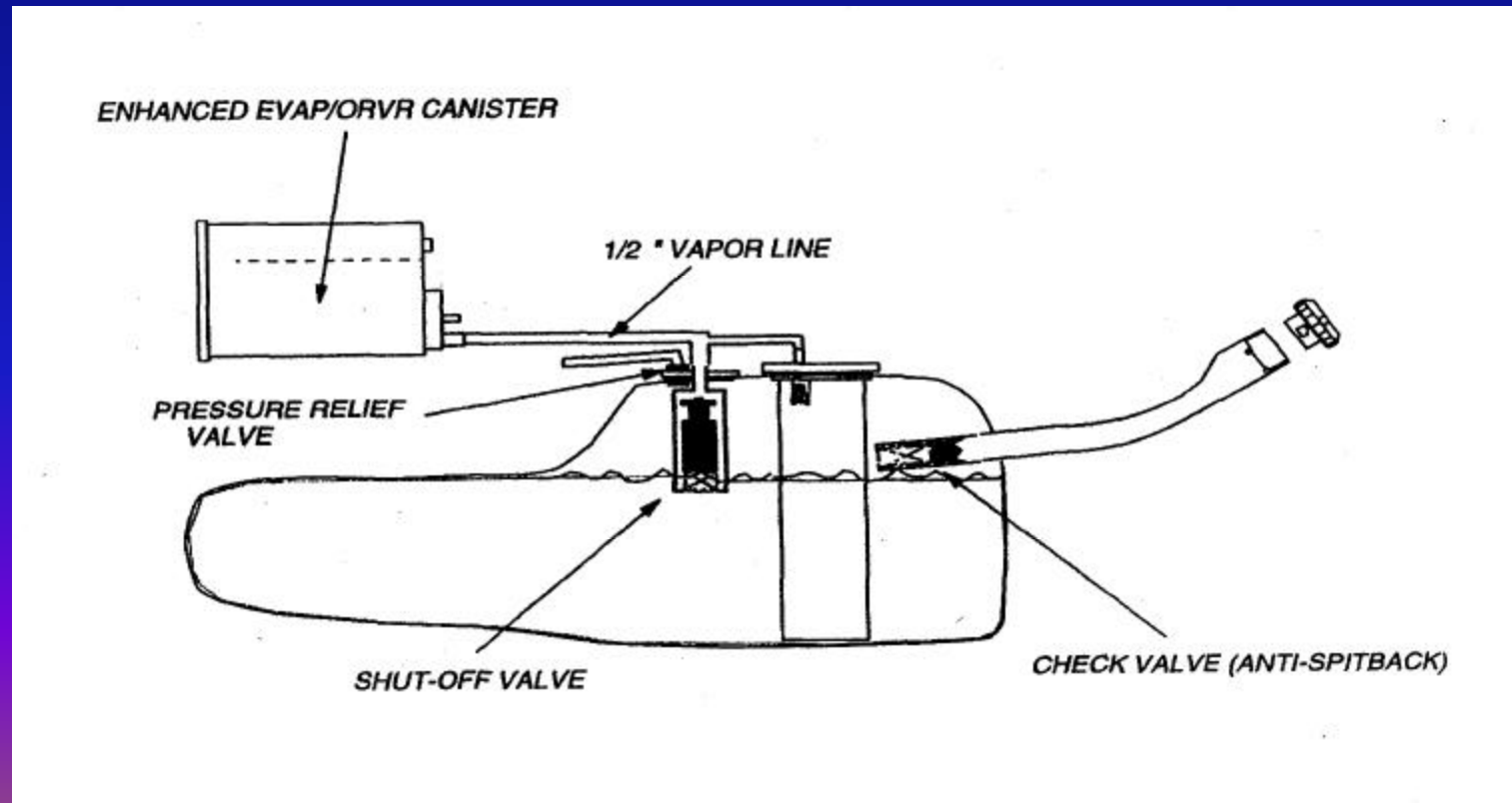
Module 3: ORVR Compatibility

- ORVR = Onboard Refueling Vapor Recovery
- Federal requirement

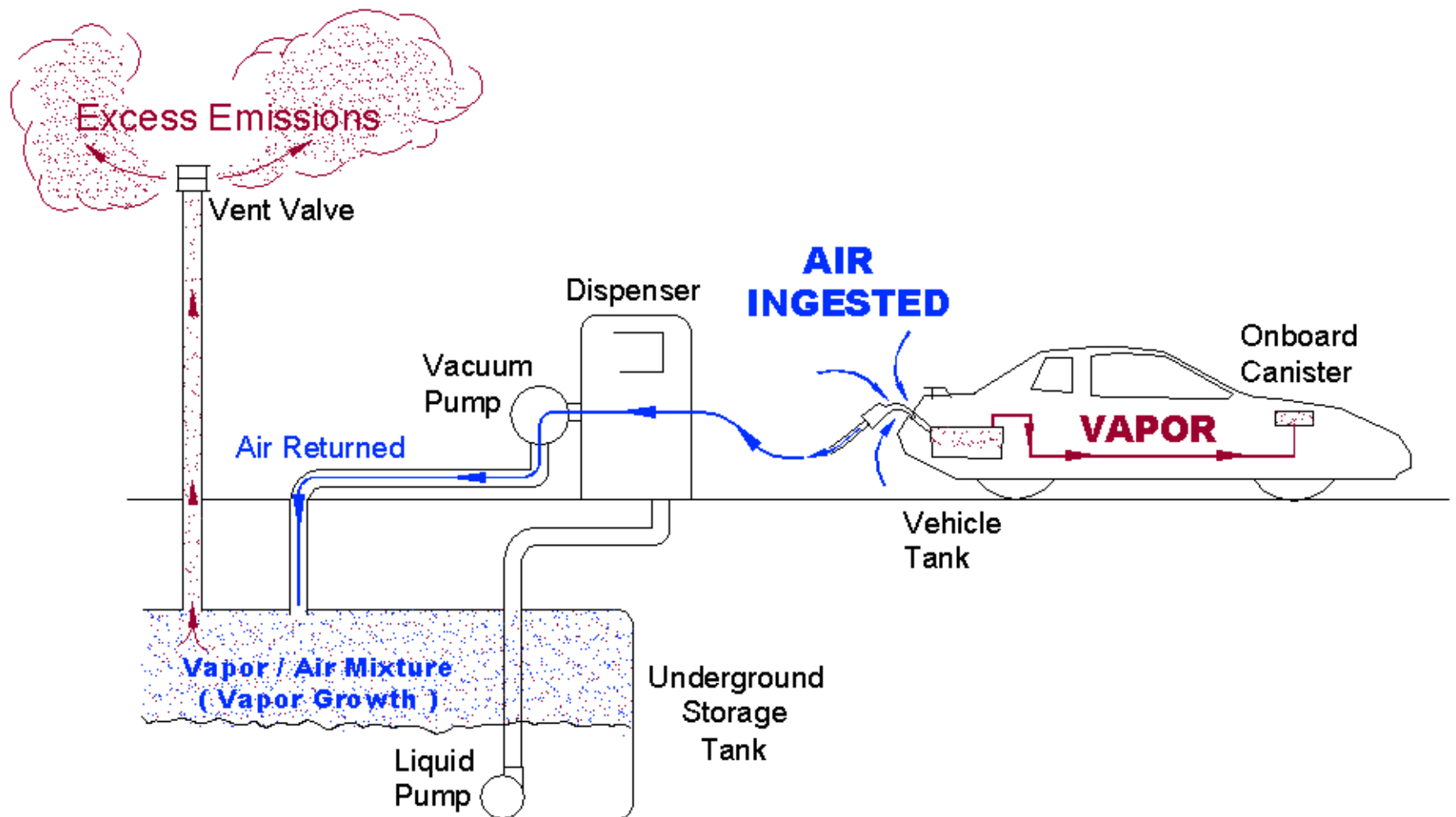


How ORVR Works

- Vapors prevented from escaping at fillneck :
 - Liquid seal - narrow fillpipe
 - Mechanical seal - gasket near fueling point



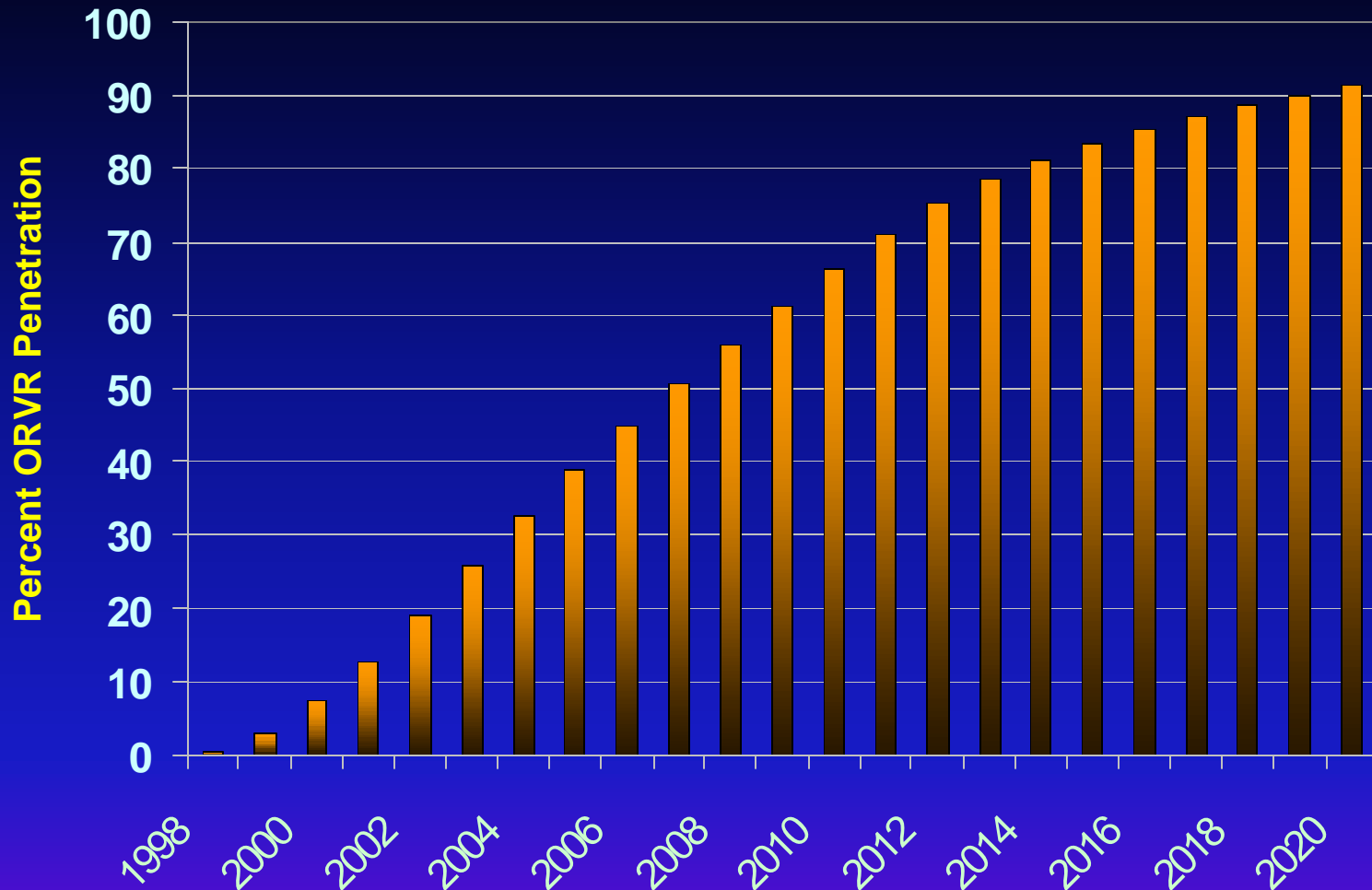
ORVR/Phase II Compatibility



ORVR Phase-in

| Vehicle Class | 40% | 80% | 100% |
|--------------------------------|------|------|------|
| Passenger | 1998 | 1999 | 2000 |
| LD Trucks & MDV (<6000 lbs) | 2001 | 2002 | 2003 |
| MD Vehicles (6001-8500 lbs) | 2004 | 2005 | 2006 |

ORVR Penetration Projection for CA



- In 2010, about 66% of gasoline throughput in CA will be dispensed to ORVR vehicles³⁹

Module 3 - ORVR Compatibility

- Require Phase II to have no excess emissions for ORVR fuelings
- Test to be proposed by applicant

Module 4 - Liquid Retention and Nozzle Spitting

- New emission category
- Liquid evaporates from hanging hardware between fuelings
- Expected to be technology-forcing
- Proposed phase-in of limits
 - first limit based on better nozzles
- spitting < 1.0 ml/nozzle

Module 5

Spillage & Dripless Nozzle

- More stringent spillage standard
 - reduce from 0.42 to 0.24 lbs/1000 gal
 - add criteria to limit drips from nozzles after fueling
- Technology forcing

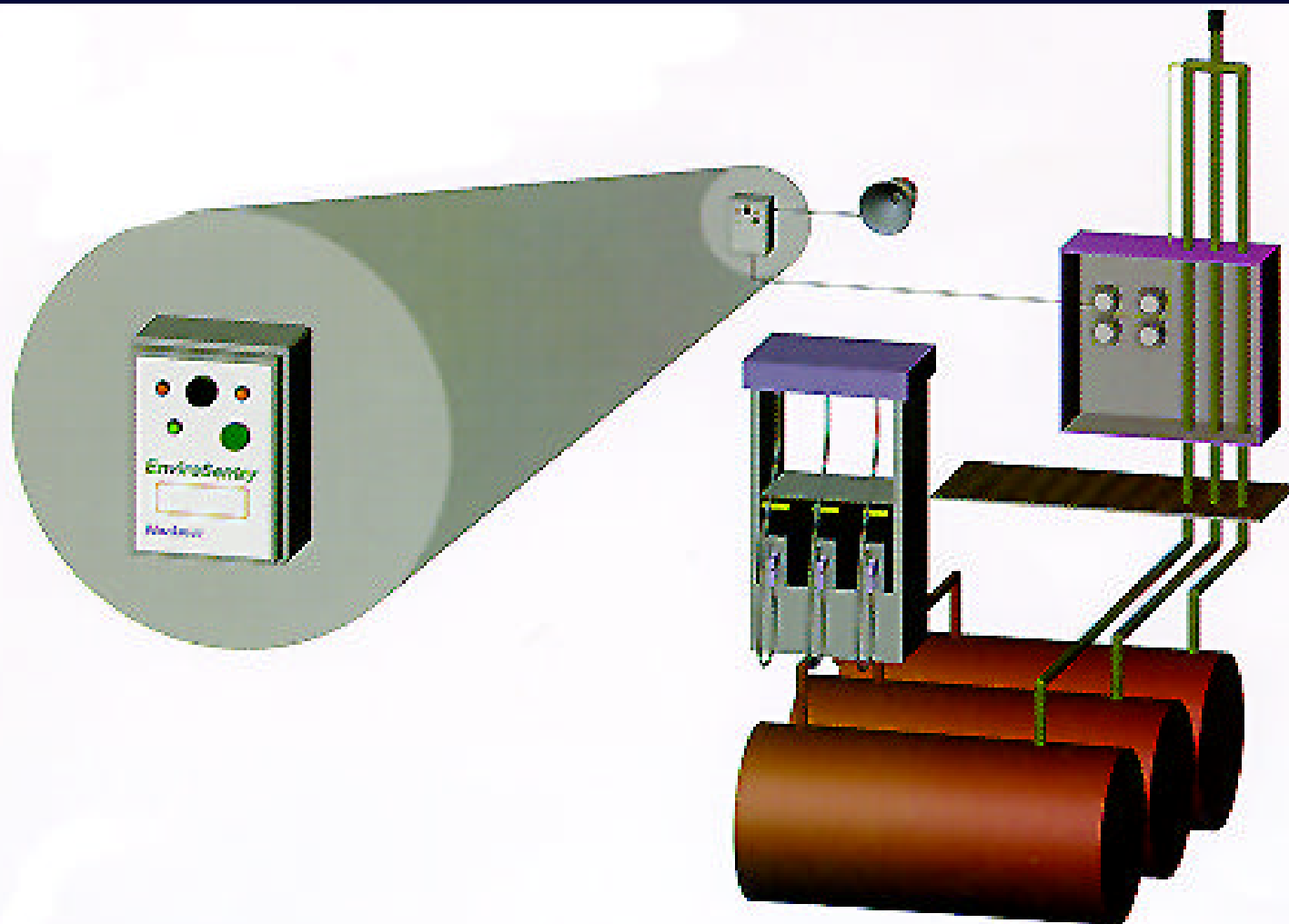
Module 6 - In-Station Diagnostics

- Current systems can dispense fuel even if vapor recovery not working
- Identify failure modes automatically
- Supplement district inspections
- Concept similar to OBD for vehicles
- Tie-in to existing UST leak monitors

Module 6 - In-Station Diagnostics

- All systems: pressure monitoring
- Balance system
 - blockage in vapor return line
- Assist system
 - vapor pump failure
- Assist systems with processors
 - processor operation

In-Station Diagnostics



* Blackmere Warning System

Certification Changes

- Application
 - maintenance manuals, test data
 - plan for installer training
- Testing
 - field evaluation increased to 180 days min
 - test matrix increased to 200 cars
- District review
 - application and draft Executive Orders

Component Certification

- State law says certify systems
- Test burden for components which can be used on multiple systems
- Non-system specific components
 - full testing on one system
 - reduced testing on subsequent systems
- System-specific components
 - full testing per system still required

Warranty Changes

- Additions to warranty tag
 - factory tested statement
 - list of applicable performance standards and specifications
- Performance standards to be met throughout warranty period
- Warranty may be conditioned to use of trained installer

Limited Term Certification

- No expiration date for existing systems
- Proposed 4-year limit
 - renew if no deficiencies identified
 - serious deficiency → decertification
 - minor deficiency → delay renewal
- Installed expired systems can be used for remainder of useful life up to 4 years

New and Revised Test Procedures

- TP-201.2D Drips from Nozzles
- TP-201.2E Liquid Retention
- TP-201.2F Pressure-related Fugitives
- TP-201.2H Processor HAPs
- TP-201.2O Drop Tube Leaks
- Revisions for nine existing procedures for Phase I and Phase II certification
- Repeal of TP-201.3A 5 inch leak test

State Law Requirements

- Change in standard triggers decertification
- Existing vapor recovery systems may be used for 4 years (4-year clock)
- Replacement parts must be certified
- New installations must meet new standards in effect at time of installation

Technology Review

- Review feasibility for:
 - final liquid retention limit
 - dripleless nozzle
 - in-station diagnostics
- Technology Review in 2002
(prior to affecting existing facilities)

EVR Key Issues

- Decertification of all systems
- Recertification timing
- In-Station Diagnostics
- Impact on Small Business
- Transfer of Certification

Decertification of All Systems

- New standard triggers decertification
 - Affects existing installations in 4 years
 - Affects other states
- Comment
 - Improving existing systems will get emission benefits sooner
- Response
 - Will delay some EVR effective dates if other parts of EVR are implemented earlier than originally proposed

Recertification of all systems

- Comment
 - Effective date of April 2001 does not provide time to recertify systems:
 - new application data requirements
 - extension from 90 to 180 days minimum
 - extension from 100 to 200 car test
- Response
 - Provided more time to certify Phase II

In-Station Diagnostics

Comment:

- Great concept - but should focus on improving systems, not monitoring
- ISD delay suggested

Response:

- Monitoring leads to improvements in durability and reliability, and
- Increased emission control
- Later effective dates allow ISD development

Effect of Proposal Changes on Small Business

- Delay implementation up to 3 years
- Exempt low throughput stations
- Technology review

Transfer of Certification

- Manufacturer responsible for system
- Transfer of certification to new company can lead loss of accountability
- Original proposal
 - certification expire upon date of transfer
- Amended proposal
 - certification expire normally, new company would need to recertify

EVR Resolution Commitments

- Pilot program for equipment-reliability tracking - plan due October 1, 2000
- Early implementation of EVR Phase I on existing systems by April 2002
- Gilbarco VaporVac: lower A/L in combination with mini-boot nozzle
- ISD pilot program to generate data for 2002 Technology Review

More Resolution Commitments

- Convene meeting and establish communication regulators from other states to discuss EVR
- Modify existing Executive Orders to authorize continued use of installed vapor recovery equipment as per CA H&SC 41956.1 (4 year clock)

Future Activities

- Continue existing system improvements
- Certify equipment to new standards
- Establish expanded CAPCOA certification review process
- Technology Review 2002
- Refine emissions inventory
- Contractor training/licensing

Rulemaking Schedule

- **March 23, 2000** - CARB approved EVR proposal, however, staff must make changes made since February 4, 2000 available for comment
- **August 2000** - Revised EVR proposal available for at least 15-day comment period.
- **February 4, 2001** - Final EVR rulemaking package due to OAL
- **April 1, 2001** - First EVR Effective Date
- EVR Website: www.arb.ca.gov/vapor/evr/evr.htm

California EVR Timeline

